What is claimed is:

1. A radiation image read-out method, comprising the steps of:

i) linearly irradiating stimulating rays onto an area of a surface of a stimulable phosphor sheet, on which a radiation image has been stored, with stimulating ray irradiating means, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored thereon during its exposure to radiation,

ii) collecting the light, which has been emitted from the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, with a light collecting optical system,

iii) receiving the collected light with a line sensor, which comprises a plurality of photoelectric conversion devices arrayed along the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, the received light being subjected to photoelectric conversion performed by the line sensor, and

iv) moving the stimulable phosphor sheet with respect to the stimulating ray irradiating means, the light collecting optical system, and the line sensor and in a sub-scanning direction, which intersects with a length direction of the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays,

wherein an end face of an optical device constituting the light collecting optical system, which end face stands facing

the stimulable phosphor sheet, is formed into a shape such that the stimulating rays, which have been reflected from the surface of the stimulable phosphor sheet, are reflected by the end face toward the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays or toward a region of the stimulable phosphor sheet, which region is located more forward, with respect to the sub-scanning direction, than the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays.

2. A method as defined in Claim 1 wherein the optical device is a gradient index lens array.

3. A method as defined in Claim 1 or 2 wherein the end face of the optical device, which end face stands facing the stimulable phosphor sheet, is formed into a shape such that the stimulating rays, which have been regularly reflected from the surface of the stimulable phosphor sheet, are reflected by the end face toward the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays or toward the region of the stimulable phosphor sheet, which region is located more forward, with respect to the sub-scanning direction, than the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays.

4. A method as defined in Claim 1 or 2 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within an ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to

visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

5. A method as defined in Claim 4 wherein the stimulable phosphor sheet is provided with a layer of a phosphor for radiation absorption, which is capable of absorbing radiation and being caused to emit light having wavelengths falling within an ultraviolet to visible region.

6. A radiation image read-out apparatus, comprising:

i) stimulating ray irradiating means for linearly irradiating stimulating rays onto an area of a surface of a stimulable phosphor sheet, on which a radiation image has been stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored thereon during its exposure to radiation,

ii) a line sensor, which comprises a plurality of photoelectric conversion devices arrayed along the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays,

iii) a light collecting optical system, which is located between the line sensor and the stimulable phosphor sheet, the light collecting optical system collecting the light, which has been emitted from the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, and guiding the collected light toward the line sensor, and

iv) sub-scanning means for moving the stimulable

phosphor sheet with respect to the stimulating ray irradiating means, the light collecting optical system, and the line sensor and in a sub-scanning direction, which intersects with a length direction of the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays,

wherein an end face of an optical device constituting the light collecting optical system, which end face stands facing the stimulable phosphor sheet, is formed into a shape such that the stimulating rays, which have been reflected from the surface of the stimulable phosphor sheet, are reflected by the end face toward the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays or toward a region of the stimulable phosphor sheet, which region is located more forward, with respect to the sub-scanning direction, than the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays.

7. An apparatus as defined in Claim 6 wherein the optical device is a gradient index lens array.

8. An apparatus as defined in Claim 6 or 7 wherein the end face of the optical device, which end face stands facing the stimulable phosphor sheet, is formed into a shape such that the stimulating rays, which have been regularly reflected from the surface of the stimulable phosphor sheet, are reflected by the end face toward the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays or toward the region of the stimulable phosphor sheet, which region is located more forward, with respect to the sub-scanning direction, than the linear area

of the stimulable phosphor sheet exposed to the linear stimulating rays.

9. An apparatus as defined in Claim 6 or 7 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within an ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

10. An apparatus as defined in Claim 9 wherein the stimulable phosphor sheet is provided with a layer of a phosphor for radiation absorption, which is capable of absorbing radiation and being caused to emit light having wavelengths falling within an ultraviolet to visible region.